

James E. Russo, Ph.D.

Associate Professor
Biochemistry, Biophysics, and Molecular Biology (BBMB)
Whitman College

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Education

- 1984-1988 Ph.D., Dept. of Pharmacology and Molecular Sciences
The Johns Hopkins University School of Medicine, Baltimore, MD
Dissertation: "Studies on Aldehyde Dehydrogenase and its Role in
Cyclophosphamide Resistance"
Advisors: O Michael Colvin, MD, and John Hilton, DPhil
- 1980-1984 B.A. with Honors, Chemistry
Illinois Wesleyan University Bloomington, IL

Faculty Teaching and Administrative Positions

- 2020-2023 Director, Program in Biochemistry, Biophysics, and Molecular Biology
- 2015-2018 Chair, Division of Natural Sciences and Mathematics
- 2008-2013 Program Director, Howard Hughes Medical Institute (HHMI) UG Science
Education grant
- 2002-2014 Director, Program in Biochemistry, Biophysics, and Molecular Biology
- 2000-2015 Health Professions Advisor and Chair, Premedical Advisory Committee
- 1995-current Associate Professor, Whitman College
- 1993-1995 Paul Garrett Faculty Fellow for Teaching and Research, Whitman College
- 1989-1995 Assistant Professor, Whitman College
- 1988-1989 Visiting Assistant Professor, Dept. of Chemistry
Franklin and Marshall College Lancaster, PA

Scholarly interests

- Biochemical nutrition and pharmacology

Role of fructose, fat, and ethanol in fatty liver disease

Vitamin (Vitamin A), and hormone (retinoic acid) metabolizing enzymes

Regulation of Hematopoiesis and Leukemic Cell Differentiation

Drug design of enzyme inhibitors

- Public Health

Health Promotion in schools and communities to reduce incidence of chronic diseases related to nutrition and physical activity

Vaccine preventable disease

- Health Professions Advising

Identifying personal and academic competencies necessary for career-specific preparations in the health professions

Funded Grants & Student Research Programs

2023 Perry Summer Faculty-Student Research Award, Whitman College,
“Analysis of early signals of hepatocellular inflammation following Fructose, Fatty Acid, and Ethanol exposures in an *in vitro* model of Fatty Liver Disease”

2021 Welty Summer Faculty-Student Research Award, Whitman College,
“Changes in Protein Expression in Fructose and Ethanol Induced Hepatocyte Inflammation and Progression of Fatty Liver Disease”

2021- Director, Summer Undergraduate Research Program (SURP) internship in partnership with Fred
current Hutch Cancer Research Center, funded by Welty Endowment

2020 Welty Summer Faculty-Student Research Award, Whitman College,
“Mechanisms of Alcohol and Fructose Induced Hepatocyte Inflammation and Progression of Fatty Liver Disease”

2019 Perry Summer Faculty-Student Research Award, Whitman College.
“Role of Mitochondrial Dysfunction in Progression of Non-alcoholic Fatty Liver Disease”

2014- Director, Summer Undergraduate Research Program (SURP) internship in partnership with the
2020 Fred Hutch Cancer Research Center, funded by alumnus Stanley Rall

2012- Director, Summer Research Intern Program Award at the Infectious Disease Research Institute
2016 (IDRI)

2009- Director, Summer Research Intern Program at the Infectious Disease Research Institute (IDRI)
2012

2009- Director, Summer Undergraduate Research Program (SURP) internship in partnership with the
2013 Fred Hutch Cancer Research Center, funded by HHMI

- 2008 Program Director, HHMI Undergraduate Science Education Program Award 2008-2012. "Enriching the Interdisciplinary Life Science Curriculum at Whitman College"
- 2007 Co-PI, NSF- Major Research Instrumentation grant. "An X-Ray diffraction Instrument for interdisciplinary and collaborative research and education in an undergraduate setting"
- 2007 Perry Summer Faculty-Student Research Award, Whitman College. "Assessment and Evaluation of the Walla Walla Public School Policy on Nutrition and Physical Fitness"
- 2004 Keck Molecular Life Science Faculty-Student Research Award, Whitman College Interaction of Retinoids, Natural Product Chemopreventive Agents, and P450 Modulators on Myeloid Cell Differentiation
- 2003 Keck Molecular Life Science Faculty-Student Research Award, Whitman College Mechanism of Retinal Oxidation in HL-60 Cells
- 2003 Co-PI, W.M. Keck Foundation Award for Whitman College Integrative Biology Initiative. Support for equipment and curriculum improvements in the molecular life sciences.
- 1999 Sally Ann Abshire Faculty-Student Research Scholar Award, Whitman College For development of cell culture methods for assessment of retinal metabolism
- 1999 Rall Summer Faculty-Student Research Award, Whitman College Inhibition of Retinal Oxidation by 4-N,N-(dipropylamino) benzaldehyde
- 1997 Rall Summer Faculty-Student Research Award, Whitman College. Design of HPLC assay for kinetics of retinal oxidation
- 1996 Murdock Summer Faculty-Student Research Award, Whitman College Retinal oxidation by mouse and human class 1 ALDH
- 1993 Murdock Summer Faculty-Student Research Award, Whitman College Characterization of 4 N,N-(dipropylamino)benzaldehyde (DPAB) inhibition of mouse and human ALDH
- 1992- P.I., Bristol Myers Squibb Award of Research Corporation: Support for "Kinetic Studies
1994 of Novel Inhibitors of Aldehyde Dehydrogenase.
- 1992 Co-PI, NSF-ILI grant. Support for computer-based science laboratory.
- 1992 Sally Ann Abshire Faculty-Student Research Scholar Award, Whitman College.
- 1991 HHMI Faculty-Student Research Award Synthesis of DEAB analogs as inhibitors of ALDH
- 1991 PI, NSF-ILI grant: Support for "Development of Biochemistry and Molecular Biology Laboratory Program.

Awards

- 2022 Lange Award for Distinguished Science Teaching, Whitman College
- 2022 Pete and Hedda Reid Service to Walla Walla Award - for public health service on school nutrition and COVID vaccine delivery
- 2007 George Ball Award for Outstanding Advising, Whitman College
- 2007 Southeast Washington Association of School Administrators (SEWASA) Award for outstanding contribution to public school education in the development and implementation of the district nutrition and physical fitness policy
- 2007 Walla Walla School District Art Regier Volunteer of the Year Award for service as Chair of the School Health Advisory Committee
- 2000 Lange Award for Distinguished Science Teaching, Whitman College
- 1984 NSF Graduate Fellowship (3 yrs)

Molecular Science Research or Review Articles - Peer Reviewed

* Asterisks below denote Whitman student collaborators supported by grants from HHMI, Keck, Murdock, Perry, Rall, and Research Corporation.

Jensen K*, Goo YA, Yahiaoui A, Bajwa S, Goodlett D, Russo J, and Voss J. Identification of Fatigue Biomarkers in Treated and Treatment-Naive HIV Patients. *Biol Res Nurs* 16: 278-287, 2015.

Russo J, Barnes A*, Berger K*, Desgrosellier J*, Henderson J*, Kanters A*, Merkov L*. 4-(N,N-dipropylamino)benzaldehyde inhibits the oxidation of all-trans retinal to all-trans retinoic acid by ALDH1A1, but not the differentiation of HL-60 promyelocytic leukemia cells exposed to all-trans retinal. *BMC Pharmacol* 2:4, 2002 (www.biomedcentral.com/1471-2210/2/4)

Russo J. Inhibition of mouse and human class I aldehyde dehydrogenase by 4-(N,N-dialkylamino)benzaldehyde compounds. In *Enzymology and Molecular Biology of Carbonyl Metabolism* 6, H. Weiner, ed. Plenum Press, pp. 217-224, 1997.

Russo, J. and Russo, R. 'Chemical Carcinogens' in Macmillan's Encyclopedia of Chemistry, J.J. Lagowski, ed., Macmillan Press, pp. 339-342, 1997.

Russo J, Chung S*, Contreras K*, Lian B*, Lorenz J*, Stevens D*, and Trousdell W*. Identification of 4-(N,N-dipropylamino)benzaldehyde as a potent, reversible inhibitor of mouse and human class I aldehyde dehydrogenase. *Biochemical Pharmacology* 50:399-406, 1995.

Russo JE and Russo RN. Demonstration of DNA Strand Breakage Induced by Ultraviolet Light: An Experiment to Show Molecular Events in Carcinogenesis. *J.Chemical Education* 70:330-332, 1993.

Kastan MB, Schlaffer E, Russo JE, Colvin OM, Civin CI, and Hilton J. Direct Demonstration of Elevated Aldehyde Dehydrogenase in Human Hematopoietic Progenitor Cells. *Blood*. 75:1947-1950, 1990.

Russo JE, Hilton J, and Colvin OM. The Role of Aldehyde Dehydrogenase Isozymes in Cellular Resistance to the Alkylating Agent Cyclophosphamide. In, *Enzymology and Molecular Biology of Carbonyl Metabolism* 2, 65-79, 1989.

Colvin, M., Russo, J.E., Hilton, J., Dulik, D.M., and Fenselau, C. Enzymatic Mechanisms of Resistance to Alkylating Agents in Tumor Cells and Normal Tissues. In, *Advances in Enzyme Regulation*, George Weber, Editor. 27:211-221, 1988.

Russo JE and Hilton J. Characterization of Cytosolic Aldehyde Dehydrogenase from Cyclophosphamide Resistant L1210 Cells. *Cancer Research*. 48:2963-2968, 1988.

Russo JE, Hauquitz D, and Hilton J. Inhibition of mouse cytosolic aldehyde dehydrogenase by 4-(diethylamino)benzaldehyde. *Biochemical Pharmacology*. 37:1639-1642, 1988.

Public policy scholarship in public health nutrition and vaccines

Russo J. Dissension over masks, vaccines distract from our common microbial enemy. *Spokesman Review* (op-ed). Feb 6, 2022.

Russo J, Edelman R*, and McCleery E*. Walla Walla Public Schools Health News Letter. v1. No.2 Sept 2007.

Russo J, Bates N*, and the Whitman College Student Health Advisory Committee. Walla Walla Public Schools Health News Letter. v1.No.1 May 2007

Russo J. Special op-ed to the Walla Walla Union Bulletin, co-authored with Beth Thiel. published Sept 3, 2006. Public report on the process by which the state and federal mandates were achieved and to encourage community action in implementing the directives of the procedure.

Russo J. Nutrition & Fitness Procedure (P6700) for the Walla Walla Public Schools; adopted and published in 2/06; in effect 8/06

Russo J. Nutrition & Fitness Policy (P6700) for the Walla Walla Public Schools; adopted 7/05

Russo J. Special op-ed to the Walla Walla Union Bulletin, published May 1, 2005. "Proper nutrition and exercise critical to learning".

Health Professions Advising

Ware OR*, Russo JE, Isaacs KHZ, and Teitz CC. Development of a Community-Wide Clinical Shadowing Program. *The Advisor- J. Natl Assoc Adv Heal Prof* 35(2):27-31. June 2015.

Scholarship of Teaching and Learning

2017 Member of PULSE

Presentation: "Integrating introductory courses to reinforce competencies and create supportive learning environments for all students"

Presenters: Collins J, Cooley A, Russo J, Schueller A, Wallace C, and Withers G.

NW Biol Conference, May 2017, Tacoma.

2009-13 Member of Interdisciplinary Science Learning Consortium (Carleton, Grinnell, Hope, St. Olaf, and Whitman Colleges), supported by HHMI grant.

Presentations of consortium:

Globally-focused Learning in the Interdisciplinary Classroom: A research-based framework for learning goals and pedagogies in science-rich courses.

Presenters: Swartz J, Ferrett T, Lopatto D, Russo J, and Stewart J.

AAC&U annual meeting, January 2011, San Francisco.

Professional Societies

American Association for the Advancement of Science (AAAS)

American Society for Biochemistry and Molecular Biology (ASBMB)

American Society for Nutrition (ASN)

National Association for Advisors in the Health Professions (NAAHP)

Outreach and public policy related activities

- 2019- Member, Walla Walla County Community Health Partnership
- 2018-19 Member of "Health and Well Being" subcommittee, Blue Mountain Regional
2014-15 Community Health Partnership (BMRCHP) for Community Health Needs Assessment (CHNA) and Community Health Improvement Plan (CHIP)
- 2011-15 Member, School Health Advisory Committee, Walla Walla Public Schools. community wide committee, including students, parents, teachers, administrators, board members, and health care professionals.
- 2009-13 Chair, Precollege Outreach Committee for middle school science teacher institute.
- 2007-09 Advisory Group member. Policy Legislation and Nutrition (PLAN) study in WA state middle schools, conducted by the University of Washington Center for Public Health Nutrition, School of Public Health and Community Medicine, Principle Investigator: Donna Johnson. Initial public dissemination of results @ WA School Wellness Policy Meeting, Seattle, WA May 8, 2009.
- 2006-07 Chair, School Health Advisory Committee, Walla Walla Public Schools. 15-member community wide committee, including students, parents, teachers, administrators, health care professionals.
- 2007 Participant in Washington State "Healthy Schools Summit" to describe Walla Walla Public Schools effort to implement a Coordinated School Health program. Sponsored by the Washington Health Foundation and Washington State Dept. of Health.
- 2007 Walla Walla regional coordinator for Center for Public Health Nutrition (University of Washington School of Public Health) study funded by the Robert Wood Johnson Foundation to assess how school nutrition and fitness policies resulted in changes in the middle school environment and student behavior and knowledge.
- 2005 Participant in "School Improvement- Connect the Dots to Healthy Schools and a Healthy Learning Environment", a workshop for implementing the Center for Disease Control and Prevention's Coordinated School Health Program (CSHP), sponsored by the Washington State Dept. of Health and the Office of Superintendent of Public Instruction.
- 2005 Participant in "Promoting Health, Fitness, and Nutrition in Schools", a workshop for school boards and superintendents sponsored by the Washington State School Directors' Association. Invited by Superintendent of Public Schools as community health representative and nutrition expert.
- 2004-05 Member, Walla Walla Public Schools Strategic Planning Core Team. Draft new mission statement for the district, and construct 2005-2010 district goals, outcomes, and action plans for teaching and learning; Adoption by the school board in April 2005.
- 2003-04 Epidemiology, Nutrition, and Cancer. In-class exercise for Pioneer Middle School 6th grade science curriculum.

Select campus committee service

Faculty Compensation Committee
COVID task force - policy committee
Curriculum Committee
Assessment Committee
Strategic Planning Committee – Curriculum
Budget Advisory Committee

Courses taught at Whitman College

BBMB 325 and 335 Biochemistry lecture & laboratory (*current*)

The 325 course provides students with a detailed examination of protein structure and function, focusing on the role of proteins in molecular recognition and catalysis. Topics include: techniques used to characterize proteins; enzyme kinetics and mechanisms; signal transduction across membranes; bioenergetics; catabolism of proteins, fats, and carbohydrates; and integration of metabolism and disease. Students actively participate in group problem-solving, and gain experience reading and critiquing scientific journal articles.

The 335 lab is a semester-long team project introducing students to the core laboratory techniques and methods in protein biochemistry for characterizing a catalytic protein. Students engage in biochemical reagent preparation, enzyme isolation and purification, enzyme and protein assays, gel electrophoresis, and immunodetection methods.

BBMB 340 Immunobiology (*current*)

This new course was designed to return immunology to the Whitman life science curriculum. The human immune system possesses a remarkable ability to distinguish among a wide array of molecular structures. This evolutionary adaptation enables the recognition and response to microbial pathogens as well as host cancer cells, while tolerating normal host cells, commensal microbes, and harmless environmental exposures. This course will explore the molecular and cellular basis of immune system function, perturbations of the immune response, and the use of immunotherapies to manipulate the immune system.

BBMB 430 Infectious Diseases (*current*)

This course uses the practices of public health to explore the role of infectious disease on human mortality and morbidity from biomedical, social, and economic perspectives. Readings, discussion, and journal writing focus on: epidemiology and burden of disease, the immune system and the host response to viruses, bacteria, and parasites; antimicrobial agents and drug resistance; and vaccine development and policy. Each student works in a team to present a week-long Case Study on a disease of global importance such as COVID, influenza, dengue, HIV, malaria, or tuberculosis.

BBMB 400: Senior Seminar (*current*)

The senior seminar serves as the capstone of the major by providing a forum for all seniors to make a full-length oral presentation. Each student describes the background, methodologies, and experimental results of the senior research project and responds to questions and critiques from their peers.

BBMB 490: Senior Thesis (*current*)

Each student takes part in a research project involving the collection and analysis of data, and write a thesis on that research.

Biol 227: Nutrition & Metabolism (current)

This course provides an introduction to the science of human nutrition. It emphasizes the ingestion and digestion of food, absorption of nutrients, and the metabolism of macronutrients (proteins, carbohydrates, lipids) and micronutrients (vitamins, minerals). We explore how the dietary patterns of the foods we eat promote health or contribute to disease risk by examining how nutrient balance or imbalance affect cellular and physiological systems. This course is recommended for students requiring nutrition for entry into health profession programs.

Biol 127: Nutrition

An introduction to the science of nutrition with focus on how the foods we eat promote health or contribute to disease risk. We examine the nutrients and their food sources, metabolism, and physiologic functions in order to be able to make more informed decisions on food choices. We also consider the social, economic, and political factors that contribute to malnutrition, food (in)security and sustainability, and dietary guidelines. Students will actively participate with weekly journals, dietary and nutrition label analyses, and discussion of case studies. This course can be taken by students who have not taken any other biology course